

limit in Yorkshire, though it is by no means to be assumed that such will be the case when some portions of southern and south-western Scotland come to be more carefully examined; the writer of this believes that many will be found to extend to that part of Scotland though skipping the northernmost counties of England.

In a few instances the author has not availed himself of the full material at his command, notably under *Geranium nodosum* (p. 179) and *Carex Gibsoni* (p. 465), yet he quotes Borrer's *herberium* at p. 344, presumably seen by himself (*vide* explanation of Flora).

For the *Batrachium Ranunculi* Dr. Lees constructs a "schema" of his own, although he has arrived "at a profound conviction of the truth of the grouping given by Sir J. D. Hooker in the third edition of the 'Student's Flora.'"

Whatever Dr. Lees's var. *incumbens* of "*Ficaria verna*" may be, the plant of Boswell-Syme is certainly not a hybrid of the usual form with *Caltha palustris*.

Under *Hieracium Gibsoni* the author observes "this has yellow styles, and it runs into *H. maculatum*; it is clearly allied to *H. caesium*." After having *H. Gibsoni* growing for some years along with *H. vulgatum* var. *maculatum* and others of the genus the writer demurs to this, and would say that it keeps perfectly distinct and can be picked out by its seed-leaves alone from *maculatum* &c. He also gives the *H. maculatum* of Smith as a synonym of *vulgatum* var. *maculatum* of Backhouse; according to Syme, in 'English Botany,' this is not so, as Backhouse named specimens of Smith's plant—"var. *nemorosum* of *vulgatum*."

Under *Potamogetum pusillus* "var. *rutilus*, Wolfgang," the description of this supposed plant will easily apply to forms of *pusillus*; the true plant of Wolfgang is rare, and many specimens so named are not it!

One query suggests itself at the last: Are not our Floras becoming too bulky? If Cryptogamic botany still advances with the rapid strides it has done lately it will become a matter of consideration whether it would not be well to publish the Cryptogams as a volume.

ARTHUR BENNETT.

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March 1888. 8vo. Albany, 1888. Pp. i-vi, 7-152.

THE whole of this number of the Bulletin is occupied by a paper by John C. Smock on the "Building Stone in the State of New York." The rocks are arranged as I. "Crystalline," and II. "Subcrystalline and Fragmental." The former comprise 1. Granites, syenites, gneisses, mica-schists; 2. Trap-rocks; 3. Marbles, serpentines. The latter have 1. Quartzites [*sic*] and sandstones; 2. Limestones; 3. Slates; and these are arranged in geological groups, all except some "New Red Sandstone" belonging to either the Silurian or the Devonian formation. The geological position and geographical

distribution of the various Building-stones in the New-York-State are described at pages 9-24; and descriptive notes of these materials, the quarry-districts, and the quarries follow (pp. 25-143). Some statistics of the quarries and their products are given at pp. 145 and 146; and a useful index follows. The author supplies careful notes on the size of the quarries, the date of opening, the possessor, and the buildings constructed of the several kinds of stone; also particulars as to the dip of the strata, direction of joints and cleavage, petrography, water in the stone, the size of obtainable blocks, and the machinery employed in raising them. This memoir has been the work of an industrious and conscientious observer, who acknowledges the kind help of numerous owners, managers, and superintendents of quarries, and refers to specimens of the rocks, illustrating their nature and economic value, that have been deposited in the New-York-State Museum at Albany.

MISCELLANEOUS.

Note on the Sense of Direction in a European Ant (Formica rufa).
By Dr. HENRY C. McCook.

THE author remarked that during the summer of 1887 he had made an observation upon the well-known "horse-ant," or *Formica rufa*, of Great Britain. While visiting the Trosachs of Scotland he found a number of nests of this species scattered throughout the glen known as the Pass of Achray, through which flows the little Achray River, "the stream that joins Loch Katrine to Achray." These nests are found on either side of the foot-walk which leads from the Trosachs glen to the "sluices," as they are popularly called, which regulate the stage of water in Loch Katrine.

1. *Structure of the Ant-hills.*—The mounds raised by the rufous ants are heaps of earth intermingled with chippage of various sorts; they rise to the height of about three feet, and some of them are six or seven feet in diameter across the base. They stand amid the tall bracken which overhangs them, and at times almost conceals them from the passer-by. The surface of the mounds is covered with bits of straw and leaves, stalks of grass and ferns, and various material of like sort which forms a quite decided thatch. Numbers of openings appear upon the surface at irregular intervals from the summit to the base, and in the afternoon at 4 o'clock the workers in vast numbers were dragging the chippage back and forth, apparently engaged in closing the doors for the night, although time did not permit an observation of the actual closure.

2. *Character of Roads and Engineering Skill.*—That which especially attracted Dr. McCook's attention was the character of the roads leading from the ant-hills to the various points in the sur-